

REMARKS

*Claim Rejections - 35 USC § 112*

Claims 1-9 and 11 are rejected in the Action under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

The Office takes the position that the limitation recited in these claims that the mol. % of the group IVA element and the mol. % of the group IIA element contained in the lithium cobalt oxide positive active material are "with respect to a total amount of the metal elements other than lithium" is not described in the specification. The Office states: "Applicant points to paragraph 25 and Table 1, which are directed towards the molar ratio and mol percentage of the total compound which does not provide support for the newly added limitations." (Action, page 3, lines 3-6).

The Office has not provided any reasoning or evidence supporting its position that paragraph 25 and Table 1 do not provide support for the newly added limitation and the position of the Office is not understood.

The molar ratio of Li:Co:Zr:Mg = 1:0.99:0.005:0.005 described in paragraph [0025] of the present specification corresponds to the formula  $\text{LiCo}_{0.99}\text{Zr}_{0.005}\text{Mg}_{0.005}$ . Table 1 identifies the mol% of each of Zr and Mg in the positive active material corresponding to this

formula and prepared according to the procedure described in paragraph [0025] as 0.5 mol%. The mol% (0.5) identified in Table 1 can only be based on the molar amount of Co, Zr and Mg of 0.99, 0.005 and 0.005 mol, respectively, described in paragraph [0025], i.e., a total of one mol. The mol% identified in Table 1 cannot be based on all of the elements Li, Co, Zr and Mg, i.e., 2 mol, because the mol% would only be 0.25 mol%.

If the Office maintains the 35 U.S.C. § 112, first paragraph, rejection, it is requested to provide proper reasoning or evidence supporting its position that the limitation recited in the claims that the mol. % of the group IVA element and the mol. % of the group IIA element contained in the lithium cobalt oxide positive active material are "with respect to a total amount of the metal elements other than lithium" is not supported by the description in paragraph 25 and the data in Table 1.

The Office also states that for purposes of examination, the mol. % will be determined with respect to all the elements in the compound "as is commonly accepted and well known in the art." (Action, page 3, line 8).

However, contrary to this statement, mol% is frequently determined with respect to a total amount of the metal elements other than lithium in lithium-containing transition metal oxides

for lithium ion batteries. This fact is evidenced by the following examples of patents and publications in which the amount of an element in a compound is determined with respect to a total amount of the metal elements other than lithium (see the marked descriptions):

- (1) Nature, Vol. 414, pp 359-365 (2001);
- (2) U.S. Patent No. 7,438,991 B2;
- (3) U.S. Patent Application Publication No. 2006/0105240 A1;
- (4) U.S. Patent Application Publication No. 2007/0196736 A1;
- (5) U.S. Patent No. 7,150,940 B2; and
- (6) Journal of the Electrochemical Society, 155 (7) A537-A541 (2008).

The above patents and publications are listed in form PTO/SB/08, which is attached to this response. It is respectfully requested that the Office initial and date a copy of the attached form PTO/SB/08 to show that the patents and publications have been considered and that a copy of the initialed form be returned to the applicants.

The description in paragraph [0025] and the data of Table 1, particularly when considered in light of the above patent and publications, provide proper descriptive support for the limitation in claim 1 that the lithium cobalt oxide contains 0.05 - 2.0 mol. % of a group IVA element and 0.1 - 2.0 mol. % of a group IIA element of the periodic table with respect to a total amount of the metal elements other than lithium. Removal of the 35 U.S.C. § 112,

first paragraph, rejection is in order and is respectfully requested.

*Claim Rejections - 35 USC § 103*

Claims 1-9 and 11

Claims 1-9 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the same combinations of references (Hamamoto et al. (US 6436582), Gao et al. (US 6277521), Hibara et al., JP 2002-158035), and Ogino et al. (US 5153082)) that were used by the Office to reject these claims under 35 U.S.C. § 103(a) in the Final Action of March 5, 2009.

In response to these rejections, claim 1 was amended in the Submission under 37 C.F.R. § 1.114 filed with an RCE of the present application on June 5, 2009, to include the limitation noted above that the mol. % of the group IVA element and the mol. % of the group IIA element contained in the lithium cobalt oxide positive active material is "with respect to a total amount of the metal elements other than lithium".

Applicants explained that the combination of Hamamoto and Gao, and the combinations of Hamamoto and Gao with Hibara and with Ogino, are insufficient to support a case of *prima facie* obviousness under 35 U.S.C. § 103(a) of the claims as amended because the intercalation compound  $\text{LiNi}_{0.7}\text{Co}_{0.15}\text{Ti}_{0.05}\text{Mg}_{0.05}\text{O}_2$  of Gao

cited by the Office contains 5 mol % of each of the Group IVA element (Ti) and Group IIA element, when the content of these elements is calculated with respect to the total amount of the metal elements other than lithium. This content is outside the ranges of the group IVA element and group IIA element defined in the claims of the application.

The proposed combination of Hamamoto and Gao, and the combinations of Hamamoto and Gao with Hibara and with Ogino, therefore, will not result in the nonaqueous electrolyte secondary battery defined in the claims of the application. For this reason, the rejections applied to claims 1-9 and 11 are not proper and should be removed.

Claims 12-15

The Office is rejecting these claims under 35 U.S.C. § 103(a) as being unpatentable over Hamamoto in view of Gao and Hibara for the same reasons applied to claims 3, 6 and 11.

However, the Office has failed to respond to the argument in the Submission filed June 5, 2009, that the data of Table 1 of the present specification show, unexpectedly, that the battery of the present invention as defined in claims 1-9, 11, and 12-15, Batteries A1 - A5, not only show suppressed battery swelling after being stored in the charged state but also exhibit improved

capacity restoration.

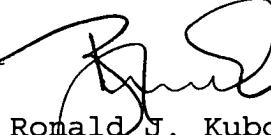
The results demonstrated by the data of Table 1 are unexpected and support the non-obviousness under 35 U.S.C. § 103(a) of the claimed battery over the combination of Hamamoto, Gao and Hibara.

Removal of the 35 U.S.C. § 103(a) rejection of claims 12-15 is also in order and is respectfully requested.

The foregoing is believed to be a complete and proper response to the Office Action dated August 18, 2009, and places this application in condition for allowance. A Notice of Allowability is respectfully requested.

In the event that this paper is not considered to be timely filed, applicants hereby petition for an appropriate extension of time. The fee for any such extension and any additional required fees may be charged to Deposit Account No. 111833.

Respectfully submitted,  
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Attachments: As identified above